

## What is Claimed:

1           1.     A method of marking for authentication a computer program with a bit-  
2 string pattern, the method comprising the steps of:

3           a)     generating a bit-string pattern, each bit in the bit-string pattern having a  
4 binary value and at least one bit having a first value;

5           b)     searching for at least one polymorphic statement in the computer  
6 program;

7           c)     associating the one bit having the first value with the polymorphic  
8 statement found in step (b); and

9           d)     altering the polymorphic statement;

10          wherein altering the polymorphic statement marks the computer program.

1           2.     The method of claim 1 wherein generating the bit-string pattern includes  
2 generating multiple bits having first and second values;

3           associating each of the multiple bits with a polymorphic statement;

4           modifying a polymorphic statement corresponding to a bit having a first value;  
5 and

6           leaving unmodified a polymorphic statement corresponding to a bit having a  
7 second value.

1           3.     The method of claim 1 including the step of:

2           e)     providing a pointer for locating a statement in the computer program;  
3 and

4 searching for the one polymorphic statement in step (b) includes searching for  
5 the one polymorphic statement based on the statement located by the pointer.

1 4. A method of marking, for authentication, source code of a computer  
2 program, designated as P, and having a complied version of the computer program,  
3 designated as E, the method comprising the steps of:

4 a) generating a binary bit-string pattern, designated as B, having a  
5 predetermined value;

6 b) modifying P to produce a separate program P1, such that the separate  
7 program P1, when compiled, functions identically to P;

8 wherein modifying P includes one of the following steps:

9 i) modifying inline assembly code of P based on B; and

10 ii) manipulating binary executable code of E based on B.

1 5. The method of claim 4 wherein step (a) generates a binary bit-string  
2 pattern having a value not equal to zero.

1 6. The method of claim 4 wherein step (i) includes correlating a binary bit  
2 in B to at least one statement of inline assembly code of P, and

3 modifying the one statement when the binary bit has a first value.

1 7. The method of claim 6 wherein the first value of the binary bit is 1.

1 8. A method of marking for authentication a computer program with a bit-  
2 string pattern, the bit-string pattern including a plurality of values, the method  
3 comprising the steps of:

4           a)     associating the plurality of values with a respective plurality of  
5     predetermined computer statements, in which each predetermined computer statement  
6     is expressible as first and second equivalent operations;

7           b)     selecting a first non-processed value of the bit-string pattern;

8           c)     searching the computer program for at least one predetermined computer  
9     statement corresponding to the first non-processed value of the bit-string pattern;

10          d)     expressing the predetermined computer statement found in step (c) as  
11     one of the first and second equivalent operations;

12          e)     marking the first non-processed value of the bit-string pattern as  
13     processed; and

14          f)     repeating steps (b) through (e) for each non-processed value of the bit-  
15     string pattern.

1           9.     The method of claim 8 in which step (d) includes altering the  
2     predetermined computer statement from the first operation to the second operation, if  
3     the first non-processed value of the bit-string pattern is a value of 1.

1           10.    The method of claim 8 including the step of:

2           generating the bit-string pattern having multiple bits of first and second values  
3     and a bit length smaller than or equal to a number of predetermined statements in the  
4     computer program.

1           11.    The method of claim 8 including the step of:

2           g)     providing a pointer for locating a predetermined statement in the  
3     computer program; and

4 searching the computer program of step (c) includes searching for the  
5 predetermined statement located by the pointer in step (g).

1 12. A method of authenticating a second computer program against a first  
2 computer program, the method comprising the steps of:

3 a) accessing a bit-string pattern, each bit in the bit-string pattern having a  
4 binary value and at least one bit having a first value;

5 b) searching for at least one polymorphic statement in the second computer  
6 program;

7 c) associating the one bit having the first value with the polymorphic  
8 statement found in step (b);

9 d) altering the polymorphic statement in the second computer program;

10 e) comparing the polymorphic statement in the second computer program,  
11 after altering the polymorphic statement in step (d), against a corresponding  
12 polymorphic statement in the first computer program; and

13 f) determining that the second computer program is a modified version of  
14 the first computer program, if the polymorphic statements compared in step (e) are  
15 not similar.

1 13. The method of claim 12 including the steps of:

2 (g) associating another bit having a second value with another polymorphic  
3 statement found in step (b);

4 (h) comparing the other polymorphic statement of step (g) against a  
5 corresponding polymorphic statement in the first computer program; and

6 (i) determining that the second computer program is a modified version of  
7 the first computer program, if the polymorphic statements compared in step (h) are  
8 not similar.

1 14. The method of claim 13 including the step of:  
2 repeating steps (b) through (f) for another bit in the bit-string pattern having a  
3 first value.

1 15. The method of claim 13 including the step of:  
2 repeating steps (g) through (i) for another bit in the bit-string pattern having a  
3 second value.

1 16. A method of authenticating a second computer program against a first  
2 computer program, the method comprising the steps of:

3 a) accessing a first bit-string pattern, each bit in the first bit-string pattern  
4 having a binary value associated with a corresponding polymorphic statement in the  
5 first computer program;

6 b) searching for at least one polymorphic statement in the second computer  
7 program;

8 c) assigning a bit having a binary value to the polymorphic statement found  
9 in step (b);

10 d) assigning another bit having a binary value to another polymorphic  
11 statement found in step (b);

12 e) generating a second bit-string pattern including the bits assigned in steps  
13 (c) and (d); and

- 14           f)     determining that the second computer program is a modified version of  
15 the first computer program, if the second bit-string pattern does not match the first  
16 bit-string pattern.